000025772

MEETING AGENDA
OU-1 PHASE III RI REPORT EPA AND CDH COMMENTS
12 30 PM 10 MARCH 93
AT ~~EPA~~ EG&G Large Conf Rm

12 30 PM Bring meeting to order
Circulate attendance list
Brief introduction
Review agenda state purpose and goals of meeting
- + Set tentative bounding schedule for comment response
- + Present New Issues
- + Review Issues Previously Presented (If time allows)

1 00 PM Discuss OU-1 Phase III RI Report Comment Response Bounding Schedule (schedule)

1 45 PM Review Actions and Decisions

2 00 PM Break

2 15 PM PRESENT NEW ISSUES
- + Baseline Conditions French Drain
- + Data Analysis Scope and Methodology
- + Work Plan Adequacy

3 00 PM Break

3 45 PM Review Actions and Decisions

4 00 PM Break

4 15 PM Review Issues Previously Presented

4 45 PM Review Actions and Decisions

5 00 PM Meeting adjourned

Circulate new Action and Decision List when available

ACTION AND DECISION LIST
OU-1 PHASE III COMMENTS MEETING 10-MARCH-93

ACTION ITEM		LEAD	DUE
1 0	**HOT SPOTS ISSUE**	EG&G	To
1 1	Investigate impact of schedule on RI FS etc	C Gee	DOE
1 2	Develop tentative schedule for implementation of Action Plan to comply with EPA/CDH requirements	De Mass	3/16
1 3	Verify turn around time for sample analysis	De Mass	3/16
1 4	Verify Lab procurement and DOT requirements	De Mass	3/16
2 0	**CONTINUE COMMUNICATIONS ON COMMENT RESPONSES WITH EPA AND CDH**		
2 1	First set of comment responses to EPA and CDH	C Gee	ASAP

DECISIONS

1 0 Hot Spots are to be included in the RI Report Risk Assessment

2 0 Hot Spot Action/Work Plan to be included RI Report as appendix

3 0 Baseline Conditions issue decisions

3 1 Present baseline groundwater condition prior to the installation of the french drain in the RI Report to include a conceptual model and nature and extent of contamination

3 2 Present the change in groundwater conditions due to the french drain

3 3 Present Baseline Risk Assessment using the conditions that exist after the installation of the french drain and include the data gained during french drain construction

4 0 Data Sets Analysis Scope and Methodology issue decisions

4 1 If contaminate pathways are eliminated from the report new data from the french drain must be included to verify the effectiveness of the french drain in removing the pathways

4 2 Incorporation of HHRA data sets

Incorporate in Risk Assessment validated data gained between Phase II and Phase III Phase III data to include data gained during 2nd quarter of 1992

Address old data in summary tables on IHSS basis to demonstrate consistency between old and ne data

Incorporate Soil Gas Survey data qualitatively for supporting evidence

Expand on discription of validation process and explain rejections

5 0 Work Plan Adequacy issue decisions

5 1 Future Work Plans will reflect knowledge gained about sampling inadequacies discovered during the implementation of the OU 1 Work Plan

5 2 OU 1 Work Plan will not be modified to require further investigative activities

5 3 Variances from the Work Plan will be explained in the report

6 0 Future meetings will be scheduled as needed

ATTENDANCE LIST
OU-1 PHASE III COMMENTS MEETING 10-MARCH-93

NAME	ORGANIZATION	PHONE
Tye De Mass	EG&G	X8760
Paul Singh	DOE/RFO	X4651
Dennis Smith	EG&G	X8636
Cindy Gee	EG&G	X8550
Gary Kleeman	EPA	294 1071
Joe Schieffelin	CDH	692-3356
Mike Anderson	Weston	980 6800

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OU-1 PHASE III COMMENTS MEETING --93

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Tye De Mass	EG&G	X8760
Paul Singh	DOE/RFO	X4651
Eric Dille	EG&G	X8684
Cindy Gee	EG&G	X8550
Gary Kleeman	EPA	294 1071
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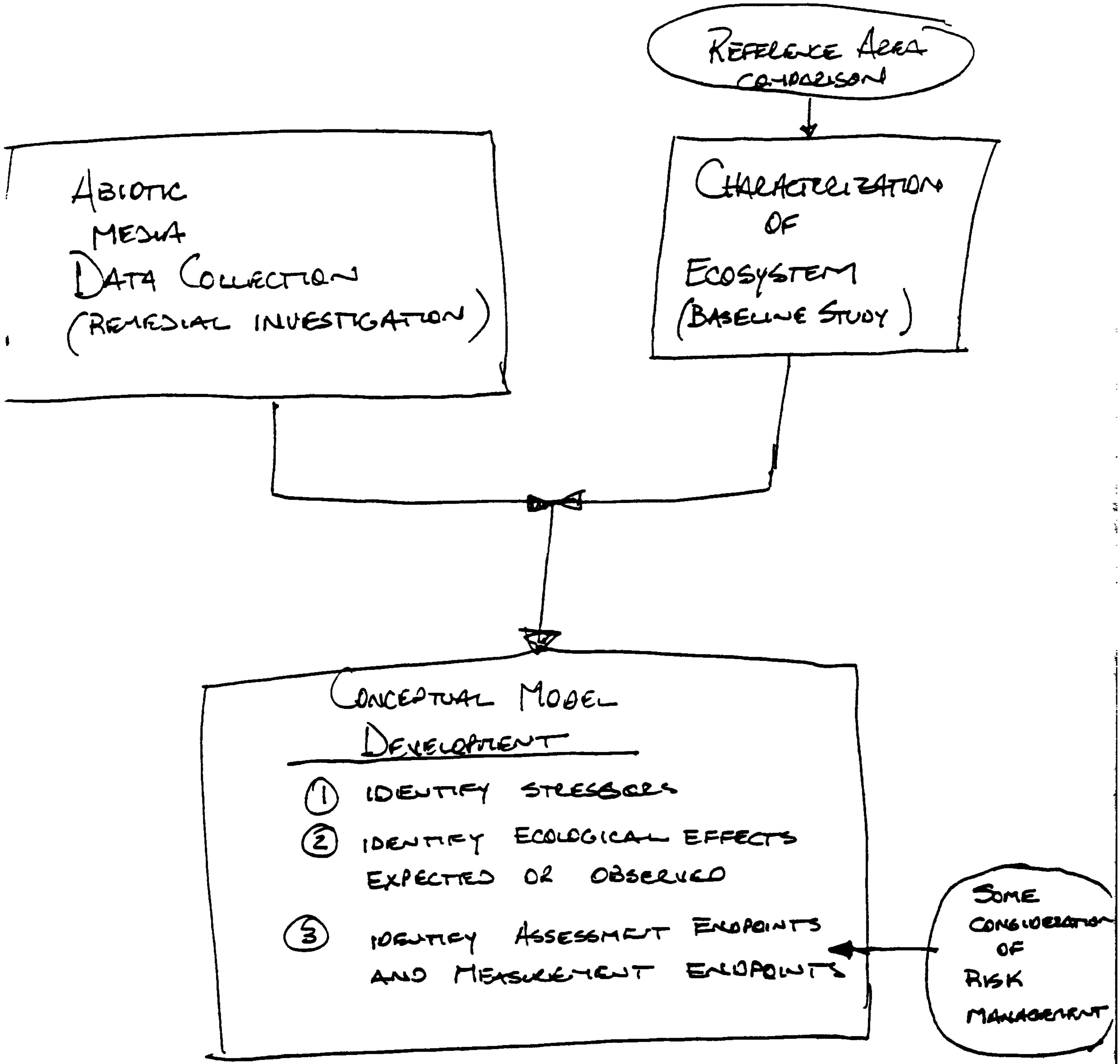
Fred Harrington	EG&G	X?
Loys Parrish	EPA	236 5055
Scott Grace	DOE/RFO	X7199



Bonnie Lavelle Approach

EXPOSURE ASSESSMENT

STEP 1 IDENTIFY "STRESSOR – ECOSYSTEM" INTERACTION

A CHARACTERIZE STRESSORS
- TYPE
- INTENSITY
- DURATION
- FREQUENCY
- TIMING
- SPATIAL DISTRIBUTION
- HETEROGENEITY

B CHARACTERIZE ECOSYSTEM (SPATIALLY · TEMPORALLY)
- ABIOTIC MEDIA PROPERTIES
- SPECIES ABUNDANCE
- DIVERSITY
- TROPHIC LEVEL RELATIONSHIPS
- ENERGY SOURCE
- NUTRIENT PROCESSING
- SPECIES HOME RANGES
- SEASONAL ACTIVITY PATTERNS

STEP 2 IDENTIFY POTENTIAL EXPOSURE SCENARIOS BY IDENTIFYING <u>OR PREDICTING</u> CONTACT BETWEEN STRESSORS AND ECOLOGICAL COMPONENTS

DEFINITION

<u>EXPOSURE SCENARIO</u> – QUALITATIVE DESCRIPTION OF HOW VARIOUS ECOLOGICAL COMPONENTS CO-OCCUR WITH OR CONTACT THE STRESSOR

STEP 3 CONSIDERING LIKELY ECOLOGICAL EFFECTS, DETERMINE THE TEMPORAL AND SPATIAL SCALES THAT WILL BE USED IN THE EXPOSURE ASSESSMENT (eg, LIFESPAN OF A SPECIES, A PARTICULAR LIFESTAGE, CYCLE)

STEP 4 IDENTIFY AND QUANTIFY EXPOSURE EQUATIONS ASSOCIATED WITH EACH EXPOSURE ROUTE FOR EACH EXPOSURE SCENARIO

~~STEP~~ $\boxed{\text{EXPOSURE ROUTE}}$

A) INGESTION
B) INHALATION
C) DERMAL CONTACT
D) EXTERNAL IRRADIATION
E) BIOACCUMULATION

$\boxed{\text{EXPOSURE EQUATION}}$

$$\text{EXPOSURE} = \frac{\left(\text{EXPOSURE POINT CONCENTRATION}\right) \times \left(\text{CONTACT RATE}\right)\left(\text{EXPOSURE FREQUENCY}\right)\left(\text{EXPOSURE DURATION}\right)}{\left(\text{BODY WEIGHT}\right)\left(\text{AVERAGING TIME}\right)}$$

DEPENDS ON SPECIES, POPULATION, COMMUNITY, ECOSYSTEM

From Beverly Ramsey - SMS/DOE/RFO consultant

Ex. from Clarks Fork, MT

3 EXPOSURE ASSESSMENT

An exposure assessment estimates the concentrations of chemicals of potential concern in the environment or the rate of intake of chemicals by organisms Exposure assessments include analysis of the magnitude duration and frequency of exposure based on data for 1) chemical sources 2) chemical distributions in various media (water sediment soil air and organisms) and 3) spatial/temporal distributions of key receptors Available data are used initially for an exposure assessment, and focused studies may be conducted to collect data for a second tier assessment if necessary

EXPOSURE SCENARIOS

An *exposure scenario* is a simplified description of how exposure may occur in a particular environment Based on the conceptual site model derived during risk assessment planning an exposure scenario describes the pathways a chemical of potential concern takes through various environmental media to reach an organism The exposure scenario also describes the exposure route that is the means of contact between the organism and the chemical of potential concern The principal routes of exposure are eating (ingestion) breathing (inhalation in terrestrial species or gill ventilation in fish) and touching (dermal contact) For aquatic organisms gill and body surface exposure to chemicals in river water or sediment pore water is the primary concern For riparian or terrestrial wildlife species some routes of exposure particularly ingestion may involve many different media. For example a mallard duck may graze on vegetation growing in contaminated soil (soil plant-duck) feed on invertebrates living in contaminated pond sediment (sediment invertebrate-duck) and occasionally eat small fish living in the pond (water fish-duck) In addition the same duck may drink water directly from the pond (water-duck) Thus the amount of chemical of potential concern ingested by the duck would be related to the sum of the amounts contained in the plants invertebrates fish and water that the duck ingests daily The absorption of the chemical by the duck may be influenced by the source or form of the chemical (the speciation) which is considered during the exposure and toxicity assessments

Characterization of the distribution and seasonal activity patterns of receptors relative to the various habitats at a site is an important step in the exposure assessment. Habitats concentrations of chemicals of potential concern, species distributions, and exposure variables related to species activities are mapped and spatial patterns are analyzed The kinds of data that may be stored and manipulated in a mapping/database system such as a GIS include habitat distributions concentrations of chemicals of potential concern species home ranges seasonal activity patterns (for example factors to account for seasonal variation in the intensity of feeding or reproduction) predator feeding rates on specific prey species and projections from transport and fate modeling conditions is impractical In these cases predictive models are used to estimate chemical concentrations at exposure points (*exposure point concentration*) Models are particularly useful for evaluating future scenarios under various remedial action alternatives

Focused chemical data on soil sediment, water and tissues of the major prey species in food webs are essential for assessing current exposures as part of the baseline risk assessment and for calibrating and verifying any models Data on the bioavailability of chemicals should be used in combination with simple exposure models to assess the potential transfer of chemicals to key receptors

TRANSPORT AND FATE ANALYSIS

Transport and fate analysis is used to evaluate data on exposure-point concentrations and to develop models to estimate exposure point-concentrations where direct measurement of chemicals is impractical (or impossible in the case of future scenarios) Both conceptual models and mechanistic models may be used in transport and fate analysis

Key Transport and Fate Processes and Compartments

For the purpose of quantifying ecological risk the UCFRB is divided into compartments when assessing chemical mobility bioavailability or ecological exposure

Atmosphere

Chemicals in the atmosphere are present in dissolved forms in suspended water droplets or as suspended particulate material Atmospheric transport moves metals between compartments (for example soil to water) Inhalation of particulate material may be considered in some ecological exposure assessments but is not typically considered an important exposure route for metals

Groundwater

Chemicals in groundwater may be dissolved aqueous species or bound to suspended solids. Mainly dissolved forms of chemicals are transported through groundwater systems. Chemicals may be exchanged between groundwater and the soil and surface water compartments via the flow of water

Surface Water

Chemicals in surface waters may exist in numerous forms Initially they may be categorized as dissolved or solid Dissolved metals may be further identified as free ion such as the water in the Clark Fork River metal concentrations and speciation may vary dramatically in both time and space In this case mechanistic models often provide better approximations of long term exposure Data collection for mechanistic models focuses on obtaining measurements that describe the system dynamics (for example for the river channel geometry and volumetric flow) in addition to existing metal concentrations Mechanistic models are also critical for describing the changes in exposure that will occur in dynamic systems under various remedial scenarios

Use of Mechanistic Models

The likely applications for mechanistic models in the UCFRB are 1) predicting metal concentrations in the soil over long time periods (greater than 1 year) and 2) predicting metal concentrations in the Clark Fork River Modeling of chemical uptake by organisms may be needed to address the differences in bioavailability among different phases of metals (for example dissolved vs particle-bound phases of copper in river water) In soil the models are used to predict the metals available to plants under various exposure scenarios Use of detailed modeling of biochemical processes within organisms (blood transport to different organs association of certain metals with proteins and rates of metal transformation and excretion) is not justified because of the limited state of development of such models and extreme uncertainties in extrapolating the results to assessment endpoints such as population responses

QUANTITATIVE EXPOSURE ESTIMATES

Information from the transport and fate analysis for each exposure scenario is used to develop quantitative estimates of exposure that serve as inputs to the risk characterization Avoidance of an area by an organism (determined by visual chemical or physical cues and species activity patterns) should be accounted for in estimates of site use For some organisms such as fish enough data may be available at the site to make accurate site-specific estimates of the frequency and duration of exposure For other organisms a more qualitative estimate must be made For example it may be reasonably conservative to assume that a deer spends only 10 percent of its time on a particular exposure site although the precise time is not known

Appropriate estimates of exposure are generally based on knowledge of the natural history behavior, and diet of the organisms This information is combined with measurements of the concentration of chemicals of potential concern at the site to quantify chemical intake. For example Table 1 illustrates the calculation of lead intake by a deer mouse based on hypothetical data. A 20-g deer mouse in a high desert environment may have a diet of insects (38 percent) seed (40 percent) leafy vegetation (14 percent), and some fungus and lichen (8 percent) (It is assumed that lead was not detected in fungus and lichens at the site therefore, fungus and lichens are not included in the exposure calculation in Table 1) The deer mouse also ingests a small amount of soil in its daily activities of burrowing preening and feeding Estimates can be made of the concentration of chemicals of potential concern in plants and animals eaten by the

- Use of available transport and fate models for Clark Fork River water and for soil-chemical plant interactions to fill data gaps by predicting exposure point concentrations when collection of new data is impractical and to predict future chemical exposures

- Use of simple food web models to evaluate transfer of chemicals through food webs to receptors higher up the food chain with supporting chemical data on tissues of key prey species to avoid uncertainties associated with the use of bioaccumulation factors and

- Quantification of uncertainty estimates by deriving probability distributions (or ranges where data are limited in screening level assessments) for exposure estimates